SARPI
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MINISTRY OF ECONOMIC DEVELOPMENT

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LETTERS PATENT

TYPE OF PATENT
☐ USEFULNESS MODEL ☒ INVENTION ☐ INDUSTRIAL DESIGN

IDENTIFICATION

PRIORITY	REGISTRATION	RECORD
COUNTRY: _____ REGISTRY No. ____ DATE: _____	No. 222/92 DATE: 02-14-1992	No. 52,883 DATE: 02-14-1992 EXPIRATION: 02-14-2012

DESCRIPTION

TECHNICAL TITLE OF THE INVENTION OR CREATION:
"PROCESS AND SYSTEM TO RECOVER ADDITIVES FROM SOLID PARTICULATES OF A DRILLING FLUID"

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THE ABOVE OWNER HAS THE RIGHT TO USE, SELL, AND MANAGE THE OBJECT OF THE PRESENT INVENTION, A RIGHT THAT CAN BE TRANSFERRED TO HIS HEIRS AND ASSIGNS. THE STATE DOES NOT GUARANTEE THE ACCURACY, PRIORITY OR USEFULNESS OF THE INVENTION, PATENTED IMPROVEMENT, MODEL OR DRAWINGS. THE PERTINENT FEES WERE PAID PURSUANT TO RECEIPT No. 800 OF 02-14-1992 THE FIRST ANNUAL INSTALLMENT (Bs. 100.00) AND PURSUANT TO RECEIPT No. 51553 OF 12-5-94 THE DOCUMENTARY TAX (Bs 4.00) AND PROTOCOL PAPER (Bs. 1.00) TOTAL Bs. 105.00 CARACAS SEPT. 04 OF [illegible] SIGNATURE OF PARTY OF RECORD /s/ Illegible [Rubber Stamp of SARPI]	FACSIMILE OF DRAWING OR INDUSTRIAL MODEL (AFFIXED WITH GLUE)

extract the greatest amount of solids from the mud. This is advisable because the recirculated perforated solids tend to shrink to finer and finer sizes, increasing the contents of solids in the mud. As the content of solids in the mud increases, the mud must be diluted by adding water, which requires the addition of more charge material in order to maintain the mud at its desired weight. For these and other reasons, in many cases it is advisable that the returned mud have a content low in perforated solids. To provide said mud, it is customary to screen it in a shale shaker with a sieve the size of which varies from 10 to 200 mesh, with the average size being 20 to 80. Until now, any solid additive, such as lubricating copolymer beads and loose circulating materials, containing particulates with size greater than the sieve of the shale shaker, can be removed from the system together with the perforated solids. As a result and as a practical matter, said particulate materials are circulated once through the system and later discarded. If maintaining the particulates in the system during several circulations is desired, it is necessary to add additional material to compensate for the material extracted by the shale shaker. This can be relatively costly.

Therefore, an objective of this invention consists of providing a device and process that will allow the recirculation of the particulate materials, especially the copolymer beads, in a well while the perforated solids are extracted simultaneously, at least a part of which shall have a particulate size that approximates that of the particulate material, thus permitting the maintenance of a system with a low solids content.

Another objective consists of providing a device and system for the recovery of additional particulate material from the drilling mud even when the latter contains perforated solids with particulates of a size commensurate with the particulate material.

incorporated hereto for all purposes. The copolymer beads can have a specific gravity in the range of 0.5 to 2.0 and, preferably, from 1.1 to 1.5 and have a size in the range of 10 to 100 mesh (size of the normal Tyler sieve), preferably 40 to 60 mesh. It can be seen that when these beads are used and an operator is trying to maintain the drilling mud with a low solids content, for example a sieve from the mesh shaker, the beads will be extracted from the system along with the perforated solids. To recover these beads and allow their reutilization, the drilling mud containing the perforated solids is passed through a line 16 to a conventional shaker 17 that can be equipped with a sieve of a finer mesh size than that of the beads. As a result, the drilling mud passes through the sieve and is returned through the line 18 to the mud well 13.

The perforated solids and the beads removed pass through a line 19 to a separation tank or container 20 that contains a flotation fluid with a specific gravity lower than that of the perforated solids but greater than that of the beads. As a result, the beads can float up to the surface of the liquid in the container from which they were extracted by means of an appropriate skimming device 21, together with some of the liquid, and they pass through a pipe 22 to the separator 23. In the latter, the beads are sieved from the liquid and can be returned through a pipe 24 to the mud hole 13 for its recirculation towards the well. The recovered liquid can pass through a pipe 25 again towards a container 20.

Similarly, the clay solids that settle at the bottom of the container 20 can be extracted, together with some of the liquid contained in the container through a pipe 25 and passed through another separator 26. In the latter, the clay solids are separated from

hydrocyclones, centrifuges, and other devices capable of performing a separation between the low density particulate material and the liquid with relatively high density.

From the foregoing, it can be appreciated that this invention is well adapted to accomplish all the ends and objectives previously indicated, together with other advantages that are evident or inherent to the method.

It must be understood that certain characteristics and subcombinations are useful and can be used without reference to other characteristics and subcombinations. This is contemplated by the ranges of the final claims.

Since the invention is susceptible to many forms of execution without departing from its ranges, it is to be understood that everything stated or illustrated here in the attached drawings must be interpreted as general but not limitative.

5. The procedure, in accordance with claim 1, in which the charged liquid is a solution of sodium carbonate.

6. In a process to drill a well, in which a drilling mud loaded with barite and containing solid copolymer beads is made to circulate through it and in which the mud returned is passed through a sieve to separate it in a first fraction that essentially consists of drilling mud loaded in a second fraction that includes the beads and solids, the stages of recovery of the beads for their recirculation in the well without at the same time recirculating the solids that have a size equal to or greater than the beads, including:

(a) making the second fraction pass towards a separation zone that contain a charged liquid with a specific gravity lower that of the solids but higher than that of the beads;

(b) allowing the beads to rise and concentrate in the top portion of the liquid while allowing the solids to settle in it, and

(c) recovering the beads from the zone of separation and passing them again together with the first fraction towards the well for their recirculation.

7. The procedure, in accordance with claim 6, in which the beads and some of the liquid coming from the separation zone are passed through a sieve to separate them from the liquid and making the latter pass again towards the separation zone.

8. The process, in accordance with claim 7, in which the liquid is loaded with calcium carbonate.